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NEHRU BAL PUSTAKALAYA

WATCHING BIRDS

JAMAL ARA

NATIONAL BOOK TRUST, INDIA

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I. Protective Colouration and Mimicry

Who does not like birds? It is a great joy to watch these beautiful and graceful creatures. They always appear so busy, flying here and there, now hopping, now running about, chirping, singing, splashing and preening, taking great care to look neat and clean. We love them for their pretty ways and happy twittering. Without our little feathered friends, the world would be a dull place indeed.

Just think of all the varieties of feathers, and in what lovely patterns they are arranged. The plumage, as this natural covering of feathers is called, is indescribably delicate. All these patterns, so lovely in themselves, serve a very useful purpose. Because of the amazing way in which the colour of the bird harmonises with vegetation and ground, accurately matching tint, shade and pattern, the plumage acts as a kind of camouflage, or "protective colouration".

The plumage of birds like snipe and woodcock, which live among weeds, grasses and fallen leaves, is mottled with irregular lines and patches. This resembles their usual background. The game birds—partridges and quails—which

visit fields, have plumage which is brown, with splashes of black. This colouration makes it difficult to see them, even if you are very near.

Birds which live among green foliage, and in the strong contrast of bright sunlight, are decked in gaudy blues and greens, yellows and crimsons. These violent patches of colour dazzle the eye of the enemy.

Quite distinct from camouflage is "mimicry", whereby weak, small birds resemble other stronger species of birds. The cuckoo, which resembles a hawk, is a good example of "protective mimicry".

SWALLOW & SWIFT

II. How Birds Can Help Man

Birds are our chief allies in fighting insect pests. Without their aid the world would have been desolate. For everywhere, in our fields, forests, gardens and orchards, there are armies of insects, small and large, which devour every variety of green things that grow. There are over 30,000 different kinds of insects in the Indian region alone. Insects are not always harmful. They, too, have their part to play in Nature's kingdom—and, therefore, many of them are

WOODPECKER

useful. But they increase at such a rapid rate that their numbers have to be kept down; otherwise they would eat up every leaf, every blade of grass and the world would become a desert.

No other creatures are so well fitted to capture flying insects as swallows and swifts. Swallows are beautiful birds with long tapering wings and forked tails. They spend most of their time on the wing—wheeling, twisting, turning, twittering softly all the while. They feed on flying insects by sweeping to and fro in the air. They skim over the surface of the water to drink without pausing in flight. They are strong and swift on the wing, but are not very much at ease either on the ground or among the boughs of trees. They cannot hop or run like other birds because they have very delicate feet which can only be used to hold slender perches like thin branches and telegraph or telephone wires.

Swifts, which circle and wheel tirelessly above towns and villages, are of a different order and are not related to the swallows though they resemble them in many ways. They can be distinguished from swallows by their very long, narrow, curving wings and uniform soot-brown plumage. They are the most aerial of birds. Rarely touching earth, they speed through the air, eating flies and midges.

The woodpecker, another insect-eating bird, digs out insects hidden in stems and boughs of trees.

Birds eat large numbers of insects in short periods of time. One little bird has been observed to eat over six hundred caterpillars in less than half an hour; another small bird picked about 3,000 plant lice off a tree in the same space of time. A pair of sparrows flew

EAGLE

backwards and forwards for over an hour, without a pause, returning twice every minute with a beakful of insects for their young ones.

.....

Kites, eagles, hawks and other birds of prey are disliked by farmers because they steal chickens and farm birds. But they also hunt field mice, rats and squirrels which damage crops. Birds of prey help to preserve other birds by killing snakes and other creatures which devour eggs and young ones. They also check diseases often fatal to man by killing destructive pests which harbour and carry germs.

Vultures, kites and crows are efficient scavengers. By removing dead animals and refuse, they keep our roads and villages clean. During famines and floods, they swoop down in large numbers upon and devour dead animals which lie scattered everywhere. The speed with which vultures devour is astonishing.

FLOWER-PECKER

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Birds play a part in the cross-fertilization of flowers too. The tongues and bills of certain species of birds are designed to extract honey from the base of flower-tubes. Some of the golden pollen dust from the flowers sticks to the head and feathers of the bird; this is then carried away to the next flower it visits, which requires the pollen for fertilization.

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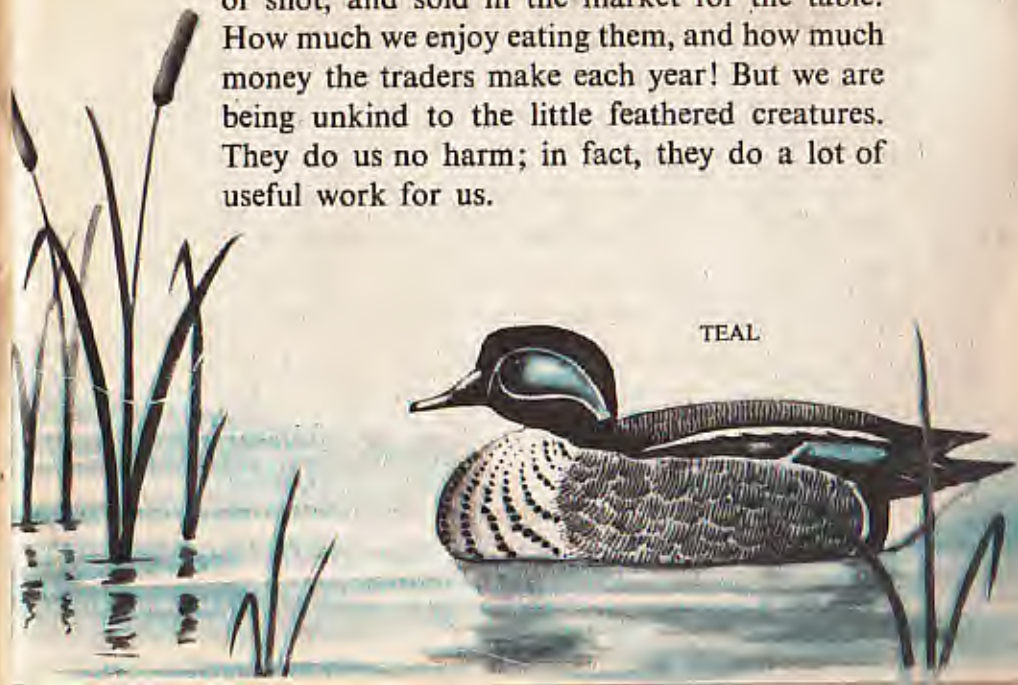
Thousands of game birds, (quails, partridges, etc.) and water fowl (duck, teal, snipe) are netted or shot, and sold in the market for the table. How much we enjoy eating them, and how much money the traders make each year! But we are being unkind to the little feathered creatures. They do us no harm; in fact, they do a lot of useful work for us.



TEAL

III. Craftsmen

TAILOR-BIRD

If you observe birds closely, you will learn a lot of interesting and amazing things about them. The birds you see flitting constantly from tree to tree are engaged in work. Like human beings, they set up home and rear children; they even have a language of their own.

In birdland there are craftsmen too—tailors, woodcutters, fishers and other workers.

Tailors: The tailor-bird uses fine fibres, cobwebs and silk from cocoons as thread. Then, taking two or more leaves, he sews them together skilfully with his sharp slender beak to make a nest.

Woodcutters: One example is the woodpecker, which hammers at tree trunks in search of insects. His bill has a sharp cutting edge. He uses it as an axe to splinter the bark or as a chisel to chip out holes.

This bird has a very interesting

KINGFISHER

tongue. It is long, rounded and barbed, or fitted with a horny tip armed with sharp barbs. The tongue darts in and out of the bill, scooping and dislodging grubs and eggs.

Fishermen: Of all the fishermen among birds, the most lovely is the kingfisher. You will meet him on the banks of wooded lakes, quiet shady pools, or by the side of murmuring streams. Perched on an exposed bough overhanging the water, he gazes unwinkingly at the water below. If a silvery fish comes swimming by, he suddenly swoops down from his perch into the water. Soon he emerges with the fish held crosswise in his long, straight bill.

Scavengers: The vulture is one of the scavengers. With his large heavy body, bald head and bare scraggy neck, he is not a pretty sight, but he is unrivalled in the perfection of flight. He soars and wheels high up in the air, surveying the world below. With his allies the kites, he patrols the streets, villages and burning-ghats, clearing away refuse from garbage dumps and removing

VULTURE

CROW

dead animals left lying on the ground.

Thieves: The commonest of these is the crow. With his glossy black plumage and dark intelligent eyes, he is really most attractive. But nobody likes him because he will steal from man or animal. Wherever there is grain, in shop or field, you will find him stealing boldly. He even robs nests of eggs and young birds.

Policemen: The drongo is a perfect example. His plumage looks like a black glossy uniform. He keeps watch over the countryside and will not hesitate to attack birds much larger than himself. Timid birds build their nests near a drongo's, for he guards not only his own nest but also those of others in the neighbourhood. He is particularly hard on that egg-robber, the crow. He is the earliest bird to rise—as soon as the faintest glimmer of dawn breaks through the eastern sky, the sweet, far-reaching whistle of the drongo is heard heralding the morn.

DRONGO

Night Watchmen: After sleeping away the daylight hours, the owl wakes when night falls.

OWL

All night long he keeps vigil over the countryside, skimming noiselessly over fields and barns in search of mice and rats. His hooked beak and strong curved talons help in killing his victims.

Hunters: Eagles and hawks are the fierce hunters of the daytime. With their sharp, hooked beaks and powerful talons, they kill great numbers of field mice and squirrels which do untold harm to crops; they feed on numberless harmful insects too. Their flight is strong and swift. Sharp hooked beaks and powerful talons help them to grasp and tear their victims with ease.

Idlers: The repeated 'kuhu-kuhu' of the koel must be familiar to you all. The koel is too lazy even to build her own nest. She cunningly lays her eggs in a crow's nest. The crow hatches the koel's eggs too and rears the young ones as his own. When they grow up, they belong, of course, to the koel family!

HAWK

Singers: The magpie robin is foremost among the singers. In cold weather he whistles softly, but in

WEAVER-BIRD

spring, he pours out a fine range of melody. He is a striking figure, specially when the melody is punctuated by a constant spreading and upward jerk of his black-and-white tail.

Dancers: It is a delight to watch the fantail flycatcher's dance. Hopping about among boughs, she suddenly stops and, turning from side to side with mincing steps, she begins dancing. She constantly opens and closes the rounded fan of her tail and flicks it daintily from side to side, almost exactly as a lady uses her fan.

Weavers: The weaver-bird's nest is just as neat as the tailor-bird's. Strongly woven from grass or palm-fibre, it is shaped like a bulb hanging from a short cord. Inside the nest runs a partition which divides the spout from the chamber in which eggs are laid. The spout helps to keep out enemies. These birds do not try to hide their nests, as they always build in company. The nests, which are of all shapes and sizes, are hung at the tips of branches or palmfronds, usually over water.

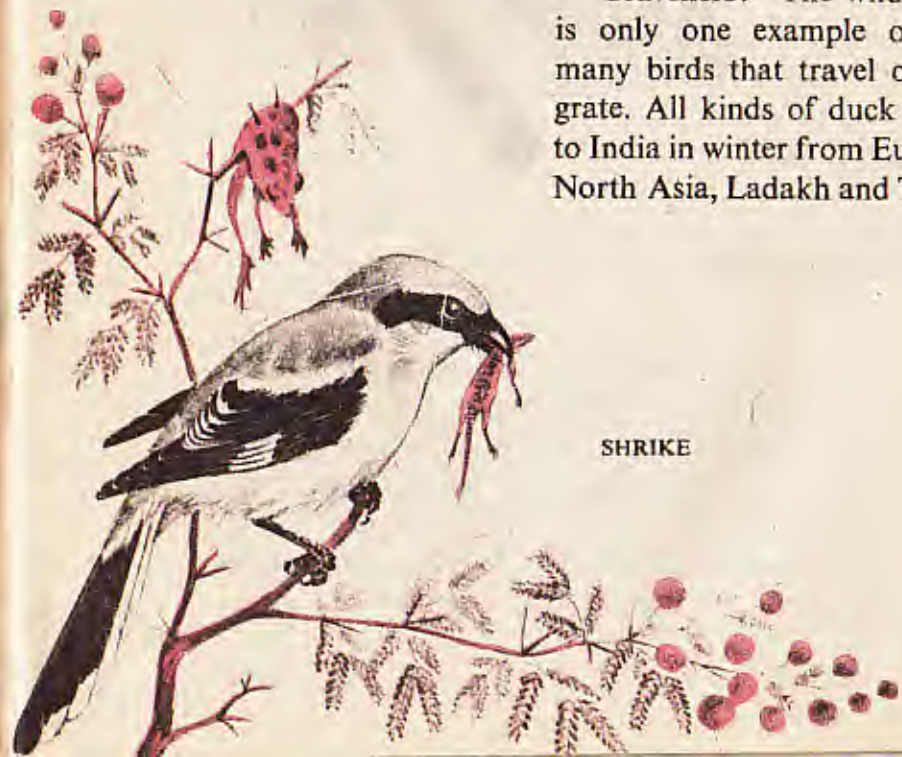
FANTAIL FLYCATCHER

DUCK

Butchers: The shrike has earned for himself the popular name of 'butcher' because he has the strange habit of impaling his prey on thorns.

He kills more than he needs to eat at one time and then stores the food in this way. He lives on insects, but does not hesitate to kill lizards and mice, which he pulls to pieces with his strong hooked bill.

Travellers: The wild duck is only one example of the many birds that travel or migrate. All kinds of duck come to India in winter from Europe, North Asia, Ladakh and Tibet.



SHRIKE

HORNBILL

IV. Habitats

Each species has its special place or habitat. An experienced bird-watcher can look at a forest, meadow, lake, swamp or field and predict almost exactly what birds he will find there. Some birds are found all over the world; others confine themselves to certain areas. Still others migrate from one country to another in winter

SUN-BIRD

in search of warmth and food, and then return in spring, when the season is more favourable.

Latitudes and altitudes affect the size of birds. Birds of the same species will be seen to become progressively smaller from the Himalayas to Cape Comorin. In the Himalayas and other mountains, birds are bigger in the cold upper regions and smaller in the foothills. Climate also affects the colour of birds.

After climate, the most important factor controlling bird life is vegetation, which itself depends on latitude, temperature, rainfall and topography. In forests the vegetation is different from that in cultivated land such as fields, orchards and parks.

Our forests are full of showy birds such as the large-pied hornbill, a black-and-white bird with a waxy yellow horn-shaped bill; gold-coloured orioles; minivets in scarlet, black and yellow; paradise flycatchers in silvery white coats and tails hanging in streamers. There are also little sunbirds in purple, green, crimson and

yellow and chlorosis in grass-green peacocks and many other brightly-coloured birds.

The birds in villages, orchards and parks are more familiar to us. The sparrow likes to be near us because he knows he will find plenty of food there. You will also find numerous snuff-brown mynas walking about, half stooping and half stalking; and the more active black-and-white pied mynas, as also the magpie robin and the black-and-yellow tit swooping around trees.

Where there are large tracts of cultivated land, you are likely to find ground birds, since there are less trees. This is the habitat of larks and chats and the buff-and-brown pipits.

Some birds like to live near meadows, marshes, edges of lakes, streams or rivers. The study of water birds is much more difficult than that of land birds.

MYNA

STORK

V. Call-Notes

Birds have a language which they use for various purposes. It is not so complicated as ours is, but it enables them to express themselves to one another. There is the call-note which serves as recognition between members of a species. There is the alarm-note, an expression of fear and a warning to keep their distance. There is the love-note, an important feature in courtship. They also sing from rivalry and defiance and sometimes give out harsh battle-cries.

Some birds tend to be silent; others are noisy and seem to know a large variety of notes. Some are good talkers like the hill myna and parakeet, while others are accomplished songsters. Screams, grunts, wild cries, hootings, moanings and whistling are familiar notes of birdland.

The stork, for example, makes a clattering noise with his mandibles; woodpeckers make a drumming noise by a rapid hammering of their bills against a tree.

The young birds have a baby language of

SAND-PIPER

their own, which is not used after they grow up! They can make known their wants, fears and whereabouts to their parents. How do young ones learn the songs and call-notes of their own species? Well, experiments have proved that some inherit them; others learn by imitating their parents.

Children seem to believe that birds sing with their bills. In the olden days bird-fanciers used to split the tongues of some unfortunate birds to make them sing better! But bird-notes are produced deep down the windpipe, at the point where it branches off into bronchial tubes. A delicate little membrane is fixed at this point which produces the note of every bird.

The small, dull-coloured birds are the finest songsters. They more than make up for their lack of showy plumage with their beautiful voices, whereas other birds use their bright colours to attract attention.

Bird-watchers depend more on their ears than on their eyes to track birds. On their walks they pause every few minutes and listen intently to the notes of a hidden bird. The loudest and best voices are heard during spring and early summer. The best time to hear Nature's choir is early in the morning and late in the afternoon.

VI. Courtship and Display

In the breeding season, territory is occupied, mates are wooed, rivals are fought, pairing takes place, and then duties of nesting and parenthood start.

In the spring-time, everything is filled with awakening life. Generally, it is the males who have to coax the females to become partners. So they don the gay plumes of the marriage season. At this time of year, peculiar fineries are thrust into prominence, like crests, frills, collars, long neck-plumes, trains, spurs, highly-coloured patches of bare skin and brightly-hued bills, feet and legs.

The female, on the other hand, is dressed in dull colours. This is because she has to sit on the nest and is exposed to danger. Her colours help her to escape the attention of the enemy. Strangely enough, there are some species, like the painted snipe and bustard quail, which do the opposite: the female is decked out gaudily. After she lays the eggs, the male sits on them and rears the young.

Have you ever seen the peacock, our National Bird, courting? It is a wonderful sight. He first majestically approaches the female, then spreads the fan of his gorgeous tail. What a

beauty he is, with silky fringes, powdered with glittering gold dust, and near the tip of every plume a beautiful spot of changing colours sparkling like a living eye!

The peacock prances and shows first the back of his screen—a huge shield of dull single tone. Suddenly, he turns around and confronts the female with all the glory of his brilliant multi-hued screen. As he dances, he shakes the gorgeous train rapidly. All the eyes in the coverts laugh and sparkle, changing their colour from green to blue, to bronze and gold and back again to green.

Courtship performances differ greatly. Some birds perform aerial acrobatics. Those which have colourful legs rise into the air and descend

QUAIL

PAINTED - SNIPE

towards a female with their legs dangling to attract attention. Some puff out their bright feathers and hover over a female.

A bird does not build its nest just anywhere. The site is chosen with care. An adequate source of food in the area around is important so that the young ones can be fed.

A good deal of fighting takes place among birds for the best nesting-places. Once their disputes are settled, each cock-bird is now a property-owner, and a more peaceful state of affairs prevails. Next he courts a female, and then begins the work of nest-building and rearing of the young.

VII. Nests and Brood Care

A constant and fierce struggle for existence goes on among birds. The breeding season holds utmost dangers for parents and their young. The eggs are sought by lizards, snakes, rats, squirrels, monkeys and man himself. Even other birds are not to be trusted. Crows and gulls are notorious robbers.

Birds build crude or careful nests, depending on their needs.

There are roughly six types of nests:

1) Open-topped nests: These are deep and cup-shaped to prevent eggs or young birds from falling down. A lining is often added of soft material such as fibres, hair, wood and even fluffy feathers. Such nests belong usually to birds like the crow, the stork and the dove, which live in colonies or pairs and can defend them.

2) Covered nests: Completely covered over by a domed roof, these nests have only a small opening on one side. The chamber is lined with small feathers or hair.

3) Nests in tunnels: Birds like the king-fisher, the bee-eater and the sand martin, cut tunnels and pits on the river banks with their bills.

4) Nests in holes: Builders in holes in

trees, rocks and walls are the woodpecker, the owl, the parakeet, the myna and the hornbill. They either dig the holes themselves, or use natural holes. The hornbill has a very strange custom. When the female hornbill begins to sit on her eggs in a hole in a tree, she is walled in by her mate. During the whole of this period, the male works hard to feed her through a small opening made for the purpose.

5) **Nests covered over by birds when leaving:** The nests of the grebe, the waterhen and the duck are open-topped, but the parent-birds, when leaving them, take the wise precaution of carefully covering the eggs. Grebes' nests are mere floating rafts of rotting weeds and reed-stems; they look more like dead vegetation than nests.

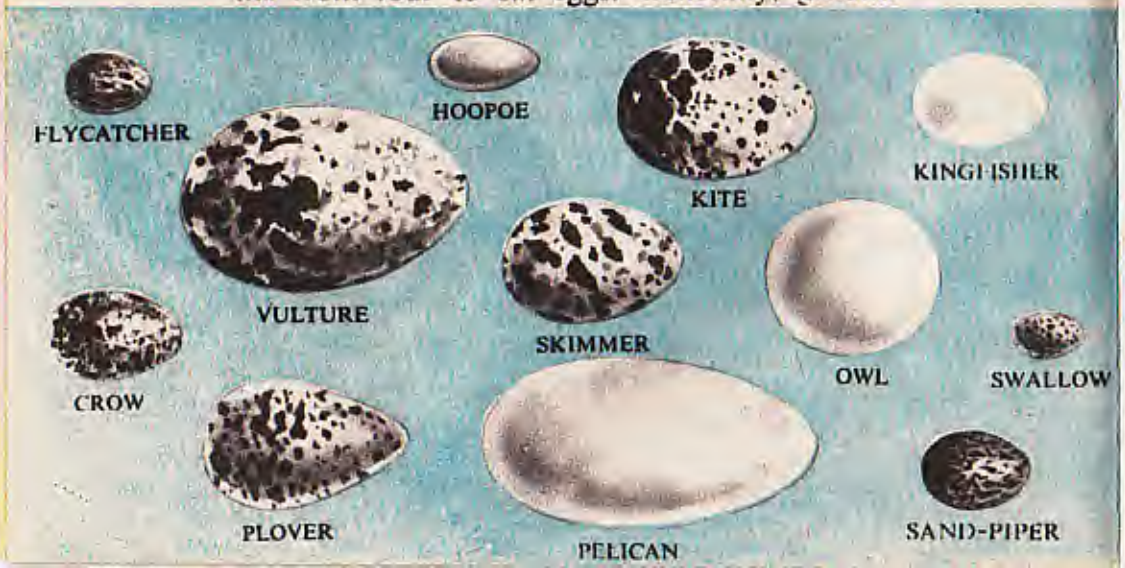
6) **Nests that are no nests at all:** Terns, plovers, lapwings and stone-curlews make no nests at all in the true sense. They breed upon the ground. Their eggs which resemble their surroundings very closely are difficult to find. Plovers collect tiny shells and pebbles, place them on a rocky shore, and lay their eggs on top of them.

Usually, it is the mother-bird alone who sits on the eggs to keep them warm, but the devoted father is ever eager to help her in every way. Sometimes he sits on the eggs, while she hops off to feed and stretch herself.

Most birds breed only once a year, but if the first brood is destroyed, they may lay a second time.

Not all eggs are "egg-shaped". Birds which lay in tree-holes, rocks, ruins or similar places where the eggs are not likely to roll about, have round eggs. Lapwings and other birds of that family have pear-shaped eggs. They are placed in a circle with the pointed ends inwards so as to occupy as little space as possible. There are birds which lay a large single elongated egg on a flat rock or ocean cliff.

The number of eggs laid by different species depends on the food supply available, their defensive capacity and habits. Some birds lay a single egg; some two; some four. Eagles lay from one to four, ducks from five to sixteen and tits from four to six eggs. Generally, ground



birds which fly poorly and are exposed to more dangers lay up to twenty eggs. Several females lay eggs in the same nest.

The colour and markings of egg-shells play an important part in their preservation. Woodpeckers, kingfishers, parakeets and owls, which have covered nests, lay pure white eggs, since "protective colouration" is not needed. There is also the added advantage in that the parent-birds can see the white eggs clearly in the dark. But where the nests are open, the eggs have the colour of the surrounding area, so as to make it difficult for the enemy to spot them. Many eggs are buff, green, blue, brown, purple or primrose.

The surface of most eggs is smooth or even glossy. Some have a highly polished appearance; others are rough and chalky in texture.

The parent-bird sits on the eggs to keep them warm. To ensure even heat, a brooding bird sheds some abdominal feathers, and there may be one to four such bare patches, which are called "brood-spots". The bird sits with the bare patches comfortably in contact with the eggs. The cooling for a short time when the bird leaves the nest for food does no harm. It may take as little as eleven days for small birds and as long as eighty days for larger birds to hatch their eggs. Soft-billed insect-eating birds and the hard-billed seed-eaters work from dawn to dusk

searching for food for their chicks. Some birds feed their young on partly-digested food. Young pigeons thrust their bills into the mouth of the mother to take the "pigeon's milk", which is partly digested food and partly a secretion from the bird. The petrel secretes an oil from the fish it eats and feeds it to the young. Whatever the method, feeding the young is a very tiring job indeed, and it goes on till they are big enough to help themselves.

Birds like the sparrow, the lark and the thrush are born with their eyes closed and are quite helpless. It may be a week or a fortnight before they are able to leave their nests. On the other hand, ducklings, chickens, baby plovers and other game birds come out of their eggs open-eyed, wearing a thick coat of down. They leave the nest as soon as they are hatched and pick their own food, run about and swim.

PIGEON FEEDING CHICKS

PLOVER WITH CHICK

Birds defend their young by attacking enemies in a most courageous way. I have watched a small bulbul driving a kite away by pecking vigorously at him. Birds exchange warning notes too when danger is near, and the young hasten to take shelter under the mother's wing.

The squatting instinct is very strong in young plovers which are exposed on shingle beaches without cover, and in game birds in sparse vegetation. At a warning-cry from the mother, or at a passing shadow, which may mean the swoop of a bird of prey, the chicks flatten themselves against the ground and remain still as long as danger is near.

The partridge and many other birds decoy intruders from their offspring by pretending to be injured or lame. The intruder goes after it in the almost certain hope of catching the wounded bird which flops and tumbles along a yard or two in front of him. As soon as he has been led some distance away, she flies off!

Yet, despite all this love and care, thousands of young birds perish every year.

VIII. Migration and Bird-Ringing

One of the greatest mysteries of bird life is migration or travelling. Every year, during autumn and early winter, birds travel from their breeding haunts in the northern regions of Asia, Europe and America to the southern, warmer lands. They make the return journey again during spring and early summer.

They are very punctual too, unless they are delayed by bad weather. We may calculate almost to a day when we may expect our bird friends to return, carrying winter on their backs.

Some species also move out of one area into another, not very far away. All birds have a certain amount of local movement, caused by the stresses of living and the variations in food supply. This kind of movement is particularly noticeable in North India where the seasons are well defined.

Birds which spend the summer in the higher reaches of mountains come down during the winter to the lower foothills or even the plains. This type is very common within India where the mighty Himalayas lie close to the Indo-Gangetic plain.

The brave little voyagers face many dangers and hardships, while travelling long, long dis-

tances through the air over hill, forest and plain and over large stretches of water. Sometimes sudden storms arise and drive them far out of their course. Often they are blown right out to sea and drown in the wild waves. Then at night bright lights attract and confuse the birds.

Migrating birds do not fly at their fastest. The migration speed is usually from 48 to 64 km an hour and rarely exceeds 80. Small birds seldom exceed 48 km per hour; most shore birds fly between 64 and 80 km per hour, while many ducks travel at 80 to 96. Migrants generally fly at under 900 metres, but some travellers have been found sometimes at greater heights.

Some birds make the long journey in easy stages, stopping to rest on the way. Others fly great distances without pausing to rest and feed. Some fly by day, some both by day and by night, but most of them speed on their way through darkness after the sun has set.

Birds usually travel in flocks. The 'V'-shaped formation of cranes and geese attracts much

GOOSE

attention as the birds speed across the sky. Swallows, flycatchers, warblers, shore birds and water-birds begin to gather in flocks—each with its own kind—and, after a great deal of excited fluttering, twittering and calling, they rise up into the air and away they go.

Usually the male birds go first to their breeding grounds in bachelor parties and the female birds follow them in a few days!

The movement of birds with the changing seasons was known from the earliest times, but people had strange ideas as to why the birds travelled, or where they went. To explain their absence from a place in a particular season, they said that the birds buried themselves in the mud and slept there throughout the winter !

Later, detailed studies of migration started. Information was gained by directly observing the habits of birds, and also by ringing. Bird movements are also studied by creating artificial conditions and studying their effects on birds.

Today, most of the information on migration has come from ringing young and adult birds. Ringing is done by capturing a bird and putting on to its leg a light band of metal or plastic. The band bears a number, date, identification mark, and the address to which the finder is requested to return the ring. The bird is then set free. The place where such a bird is shot, captured or found dead gives a clue to the direction and locality to which the bird has migrated.

From ringing it has been proved that the main migratory movement is generally north to south in autumn and vice versa in spring. Thus the main travellers come to India through the north-west, and start from between Lake Baikal and the Sea of Aral in Siberia. But some storks come over from as far as West Germany.

The other route used by birds from Mongolia and Chinese Turkestan is over the passes in the north-eastern Himalayas. The main routes

RINGING

of entry into India are through the passes on the north-western and north-eastern flanks of the Himalayas, but certain birds on the direct route fly straight across the main Himalayan range and do not detour.

Ringing has proved that birds cover large distances. There is some evidence to believe that the woodcock on its winter movement flies from the Himalayas to the Nilgiris without pause, a distance of 2,400 km. The wild duck comes to our lakes from Central Asia and Siberia—flying 3,200 to 4,800 km over the Himalayas. The rosy pastor comes from Eastern Europe or Central Asia. The wagtail, about the size of a sparrow,

WARBLER

WAGTAIL

CUCKOO

comes from the Himalayan regions and Central Asia to the plains. Smallest of all, the willow warbler—half the size of a sparrow—covers as many as 3,200 km to reach us every winter!

Why do birds migrate in spite of heavy loss of life on the way? Primarily to escape bitter cold and a restricted food supply. In the case of water-birds the food supply disappears altogether when the water freezes and the fish and other sea-food are difficult to obtain. The main reason for the spring movement is the availability of nesting sites, and the need to escape summer heat.

The migration of birds is a fascinating study indeed, and there are many unsolved problems which lie ahead. For example, how do the birds know when to start? How do they know their way over the sea without any landmarks? How do they manage to return year after year to the same locality? How do the young cuckoos join the adult birds without previous experience, and without any guidance from adult cuckoos which fly to India and Africa several weeks before the young cuckoos are ready to leave their foster-parents? These and many more such interesting questions lie ahead of you to solve!

IX. Body-Structure

Even more fascinating is the body-structure of a bird and the usefulness of every part. Birds are animals that are covered with feathers. The skeleton of a bird is rather like that of a man. They have two wings, two legs and a tail. The wings are made in such a way that they can be folded up easily in the shape of a "Z", retaining freedom of movement at the shoulder.

Actually, the wing is just like the human arm, the main difference occurring at the "hand", which in birds has become one large and elongated finger. Over these bones the wing muscles and feathers are placed in such a way as to form the curve of a bird's wing. A glance at a bird's open wing will show you the curve upwards, umbrella-fashion. If an open umbrella is pushed up and down quickly, you will find it much easier to push it up than down. Why? Because the curve of the umbrella seems to grip the air on the downward pull. This is roughly the principle that enables a bird to fly.

The wing feathers are grouped in clearly defined masses. Into the long finger or "hand" are fitted the first flight feathers or "primaries", usually ten in number. These are used in steering. From the forearm grow the "secondary"

SKELETON

flight feathers—about twelve or fourteen in number.

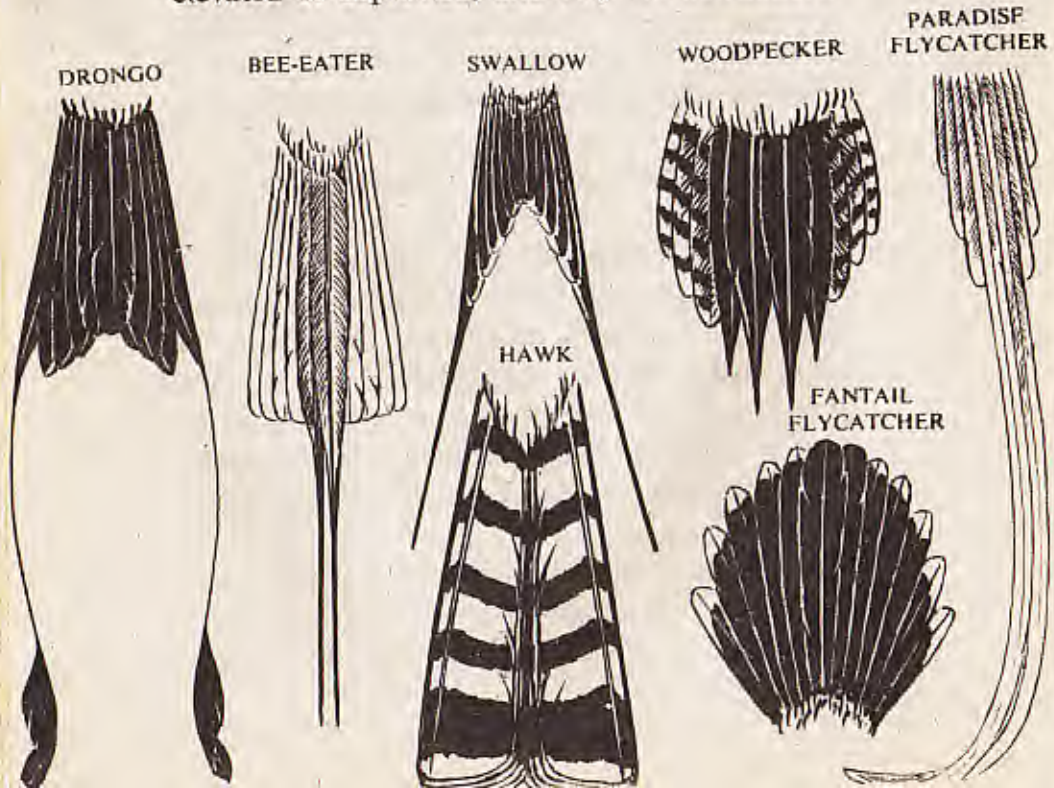
The other groups of feathers serve to streamline the wing, build up its curve and give support to the flight feathers. At the junction of the wing and shoulder are a group of feathers called the "scapulars". These feathers are quite large in most birds, and help in streamlining the lines of the wing to the body, as also to cover the junction of wing and body when the wing is folded, thus preventing moisture from trickling down inside.

Birds have strong, light and hollow bones strengthened with girders. The breast-bone is broad with a ridge on it like the "keel" of a

ship. To this ridge are attached the powerful "pectoral" muscles (the muscles of the breast) by means of which the bird moves its wings.

The tail of a bird is formed in a fan of overlapping feathers, usually twelve or fourteen. The central feather is on the "top" of the tail, the others overlapping one another from "beneath" it on each side. When the tail is closed, it is the central feathers you see, with the edges of the others receding beneath.

Tails are capable of being expanded or closed, elevated or depressed, and they act as rudders.



Where the wings and the tail are both ample, as in the sparrow-hawk, the flight is easy and graceful; where the tail is short and the wings are fairly long, as in the snipe, the flight is generally rapid and jerky; but where the tail is long and the wings are short and rounded, as in the treepie, the flight is a laborious flutter.

There are three types of flight: (a) *Flapping* which is used by the great majority of birds; (b) *Gliding* whereby the bird produces enough speed and goes along without any movement of the wings; (c) *Sailing* or *soaring* is the most remarkable method. The bird gets along by prolonged circling without any active movement of the wings.

Birds that fly only in the open have long, narrow, pointed wings, and fly with remarkable rapidity, producing a loud musical "sing" with the tips of their wings. Birds that live in the woods have short, rounded wings, and make a noise at the start of the flight. But the owl, though short-winged, has a silent flight, because the quills are covered by a sort of velvet pile, so that the sound is muffled. This is to prevent his prey from hearing him.

Different birds alight in differnt ways. Some depress their spread-out tails and work the wings with the shoulders up and the tips pointing to the ground, and as soon as they have touched the earth, fold them gracefully.

Birds are very particular about their feathers, and spend a good deal of time cleaning, preening and oiling them. The oil-gland, from which the bird oils its bill when preening, is at the base of the tail. Many birds cast off their feathers once every year. This is called moulting and takes place in the autumn when every feather, great or small, is cast off and replaced by a new one. Some birds moult twice a year—in spring and in autumn; some change their plumage partially or completely thrice a year.

Bills are beautifully adapted to aid birds to find and eat their food. Kites, eagles, hawks and falcons have short, hooked bills, so that they may swiftly and easily tear their prey. Herons have long bills to spear slippery fish with. The long, sensitive, probing bills of the waders are thrust deep into the soft mud of the swamp to take out their food. The short, conical bills of the sparrows facilitate the husking and crushing of the grain they eat. The broad, flat bills of ducks contain rows of small plates like teeth, through which water is strained and small particles of food retained.

Swallows and swifts possess short bills, but their mouths are very wide to enable them to catch flying insects. The tiny sun-birds have slender curved bills to probe flowers for nectar.

The bill is like a hand to the bird; with it the

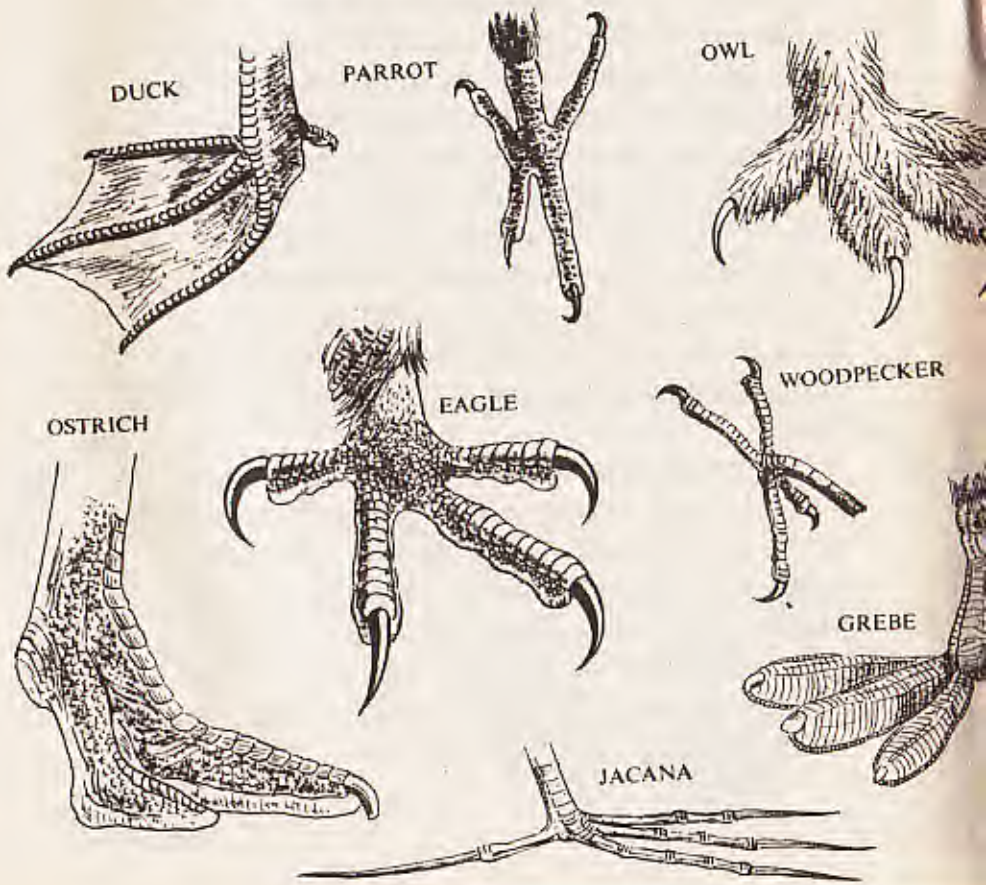
bird catches and picks up things; communicates; weaves; stitches; ministers to the needs of its young; kills its prey and defends itself. The bill is also a tool which can be used as a hammer, pincers, tweezers, pruning shears, nutcracker, hook, spear and strainer! To help in all these operations, the neck of the bird is more flexible than that of any other animal; so much so that it can turn its head round completely.

The feet of birds are as diverse as their bills. Running, perching, scratching, wading and grasping are obvious functions. Some use their feet for attack or for defence. The first toe corresponds to our thumb and is at the back, the second is on the inside and has two bones; the third is in the middle and has three joints, the fourth on the outside has four joints. This arrangement is the rule in almost every sort of bird.

Birds which perch and hop on the ground have a long hind-toe in order to grasp the branch firmly. In ducks the three toes are joined by a web and the hind-toe is hardly seen. Herons have slender, widely-spaced toes to keep them from sinking into soft mud. Larks and pipits of the field have greatly enlarged hind toe-nails which act as braces. The swallow's fore-toes are joined together. The woodpecker's toes are in pairs. The grazing bird, the ostrich, has huge feet with only two toes!

Small birds live only ten to thirteen years, eagles up to twenty years and some large birds as long as ninety years.

The body temperatures of birds range from 104°F to 110°F. In man and in mammals generally, the body temperature in health is only 98.4°F. At a temperature of 106°F man would be in a raging fever, and death would take place before 110°F was reached.



X. Nesting-Boxes and Food Tables

After learning so much about birds, I am sure you would like to have them near your house and garden, so that you can watch them and gain more information about them. Birds will come near you if you place food for them and provide simple nesting-boxes for them to build little nurseries and rear their young.

You can watch them building their nests and feeding their young ones, but you must take care to keep still and not to go too near them. If they feel disturbed, they will desert the nest and start another at some safer place, where you won't be able to see them. You may take a peep at the babies when they are hatched and when their parents have gone to bring food for them. Never, never try to take one from the nest; baby birds are delicate little things and they can be injured easily.

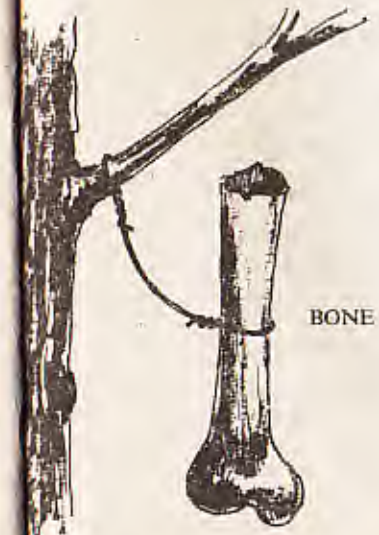
You can scatter some millet or other grain in a suitable spot in your garden. Conceal yourself carefully and be still. A little sparrow is bound to come hopping along. While approaching the food, it will cock its head first to one side and then to the other, to make sure that there are no enemies lurking around. It may even fly off without eating, but do not get impatient

(patience is a great asset in bird-watching). Finally, it will come back with a whole bunch of other sparrows whirring to the spot and settle down to feed.

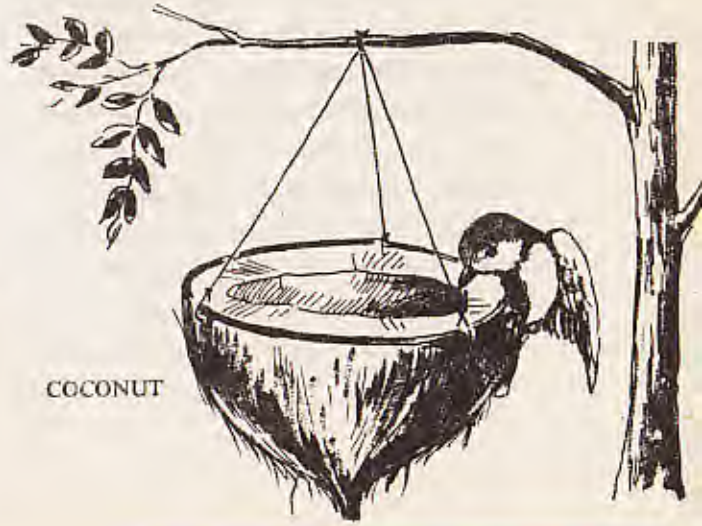
If you can lay your hands on a coconut, cut it into half with a saw, bore a hole in each half, put in some strong string and hang the two halves upside down on some tree or outside the window. Coconut provides a very good feast for the birds. The tits specially are very fond of it.

Some day bring a large hollow bone from a butcher's shop, clean it, put in some fat or mashed potatoes and hang it in a favourable place in a tree which you can visit now and then.

You can also make two kinds of food tables. Fasten a board, on a pole, which must be at least one metre high so that no cat can reach it.



BONE



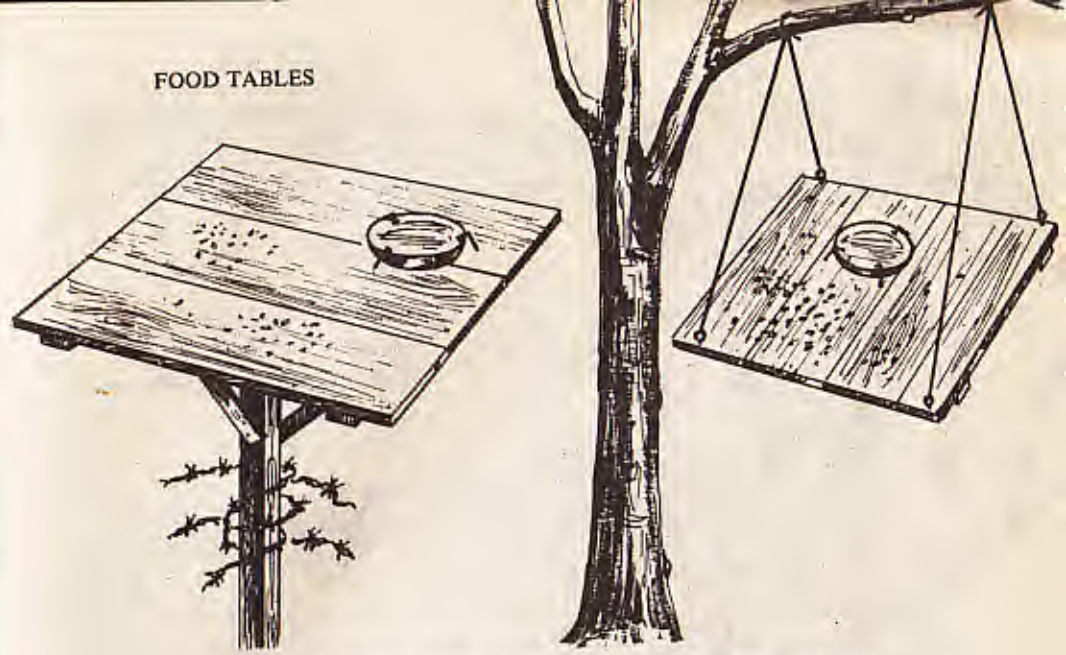
COCONUT

Stand it in some shady place and put some food on it. The second type is a board suspended by strings from the branch of a tree, the string going through four holes at the four corners of the board. Do not forget to put water on the tables. The vessel containing water must be fastened to the table, else it will soon get upset. Birds drink very often and love splashing, specially in the summer.

If you have any old or dead trees in your garden, do not chop them off. In such trees you will find many natural holes and hollows which a number of birds like to use as a nursery.

If a dead or old tree spoils the look of your garden, you can plant some beautiful creepers near it, like the bridal-creeper or bougainvillaea, to cover up the tree. This will beautify your garden and the birds will stay with you too.

Similarly, you can build nesting-boxes. But first you have to take into account the following facts: the type of sites that birds like for nesting; the kind of nests they build; and the materials they use. Different species of birds have different tastes and needs and your effort will be wasted if the little houses do not suit the birds in your neighbourhood. If you carefully examine the cavities in trees and stumps which birds naturally use, you will find a wide variety in size, shape and location.



Here are a few simple rules on the making and placing of nesting-boxes:

(a) The opening of nest-boxes should be several inches above the floor of the box.

(b) The nest-boxes should be erected on poles from ten to thirty feet above the ground, or fastened to the sides of trees whose branches do not block the view.

(c) All boxes should be taken down after the nesting season is over, and cleaned for the next season.

Nesting-boxes need not be expensive; they can be made easily out of ply-wood or deal wood, empty soap-boxes and packing-cases. You can make all the boxes yourself.

Now for some more details about nesting-boxes. First and foremost, they must be water-

DEAD TREE WITH CREEPER

BREAD-CRUMBS ON TABLE

proof and well-ventilated. They should be painted in soft woodland tints like brown, grey or dull green.

The nesting-boxes can be of various shapes, and their sizes should suit the size of the birds for whom they are meant. Thus, for the myna, the box should have a floor about 15 cm × 15 cm and a height of 45 cm; the entrance should be about 15 cm above the floor, and the entrance hole may be 5 cm in diameter.

For the sparrow, the box should be 15 cm high, and it should be open on all sides. For an owl,

NESTING-BOXES

the floor should be 25 cm × 45 cm, the height 45 cm, the entrance 10 cm above floor level and 20 cm in diameter. For a woodpecker, the box should be 38 cm high, the entrance 30 cm above floor level and 5 cm in diameter.

These nesting-boxes should be so placed that they are shaded during the heat of the day, but let in some sunlight in the mornings and evenings.

By providing food and nesting-boxes for birds, you will notice many types, even the very shy ones will come near you. You are, in fact, setting up a bird refuge—commonly called a bird "sanctuary"—in your garden, where they will be safe from harm, protected from hunters and marauders, and from hunger and thirst. It is you who will guard them.

NUTHATCH

XI. Hints on Bird-Watching

To be able to identify birds, you need a pair of good eyes and ears, a note-book, a pencil, an illustrated bird-book, and some training in careful observation. And to be a successful bird-watcher, the beginner must imitate, in some respects, the behaviour of the fox. While human beings find it difficult even to approach birds, foxes manage to capture them for food. How do wild animals do this? Well, they are protectively coloured; their feet are softly padded and their

movement is noiseless; they go on all fours, crawling close to the ground and keeping concealed as much as possible. Their movements are very slow. In all these things, we can imitate them without much difficulty.

First of all, avoid black, white, and strikingly coloured clothes, for the birds will at once spot you out. Wear, instead, a dull, dead leaf or dull green colour. You can use violet too, since birds are incapable of seeing this colour. Put on rubber-soled shoes to avoid noise. Avoid walking on dead leaves or twigs which will make a lot of noise and frighten away the birds.

Next choose a spot—trees, shrubs or grass as cover—and sit there motionless. Do not turn your head quickly, or swing your arms about. If you sit still, birds will come quite close to you, and that will help you to observe them well. You may need to advance on your knees, or crawl like a serpent. When approaching birds in the open, a zigzag, circular or sidelong movement may bring you near to them quicker than a direct forward movement.

He who wishes to watch birds must take another lesson from the fox—he hunts alone. Alone, you have no one to talk to, and there is no interruption either. When watching birds, you have to give your whole attention to it. As a matter of fact, it requires great physical

control and mental concentration just to watch for long. But bird-watching is not all keeping still. In search of birds you may have to drive, fly, sail, cycle, row and walk. You may have to climb on rocks and trees and be pecked at and scratched by angry birds of all sizes. You may have to be up all night, wet, hot or cold. So bird-watching can be a picnic, a hobby, a quiet pastime or an arduous scientific pursuit.

Spring and early summer are a good time to begin identifying birds; they are easier to see and then there can be no confusion with winter visitors. July is the most interesting month in the bird calendar, for then many young birds are about.

Early mornings and late afternoons are usually the best times for observation, because most birds are then active and singing. Birds are more shy and retiring on windy days when they can spread their wings and be borne away with little effort. So days with strong winds are unfavourable for bird study. Most birds seek shelter during heavy rains, but are active during light, warm showers.

Water-birds should be studied from long range. Or if you are careful, you can try to sneak up directly towards them, and you may get quite near them. It is this pitting of your wits against the cunning of the birds that con-

stitutes one-half of the interest in bird-watching. But water-birds can be best observed from a small "blind" near the water's edge.

You can also try to follow every strange note to its source, like an expert, who usually hears a bird first before he sees it. Some birds are ventriloquists. When the bird is hidden by leaves, its call seems to come first from one tree, then from another. Many birds sing so softly that they seem to be far away though they are really just at hand.

In your note-book keep a record of the following points. First of all, note the date; the time of day; weather conditions and wind; and the name and type of locality, a very important point. Next, record the size of the bird. At first, it will be difficult for you to judge the size in cm. But you can always compare it with some well-known birds. Here is the size classification with the key birds: sparrow, bulbul, myna, crow and kite. You should write down the key birds on the front page of the note-book as all these birds must be known to you. Use the signs plus (+) or minus(—) if the bird is bigger or smaller than the standard size, without reaching the next class. Thus, a bird slightly bigger than the sparrow, will be indicated by S(+) or a bird slightly smaller than the myna will be indicated by M(—). By making frequent

and proper use of such a scale, you can become quite proficient in judging the comparative sizes of birds.

Then record the shape of the bird, that is, whether the bird as a whole is slim or stout. Some allowance should be made for the state of the body feathers, since birds can raise or lower their feathers at will.

Then, note whether the bill is large, straight, pointed, curved, slender, heavy, flat, well-hooked, small or conical. If you observe the shape of the bill carefully, you may be able to place the bird in the family to which it belongs. Thus if you see a small bird with a short conical bill, it is probably a sparrow. If it is a little smaller than the sparrow and has a short, slender, slightly curved bill, it is probably a warbler, or belongs to some other insect-eating family. The colour of the bill should also be noted down.

Next, the size and the structure of the legs. Observe whether the bird has long or short legs. If it has long legs, then it must be a wader. Similarly, if the feet are webbed, it must be a duck. The colour is also useful.

The length and the shape of the tail are important too. Notice if the tail is short, forked, notched, square-tipped, round-tipped or pointed. Does the bird cock its tail up, or does it hold it down? Does it wag its tail? For example, if you

see a large mottled brown bird with a hooked bill and a slightly forked tail, it is probably a kite. Again, if you see a bird with a long straight pointed brown and yellow bill, a short tail, long legs and a white plumage, it can be a heron.

Observe if the bird has a crest, and if so of what colour and shape.

The colour of the body is very important; it is about the only feature ordinarily observed. First, notice whether the bird is brightly coloured or sober in hue, and which is the predominating colour. Then note the colour of the upper part, i.e., the head, back, back wings and upper tail; next that of the underparts—throat, breast and belly, and under tail. Remember the breast and belly often will seem darker than they really are, as they are in the shade; thus a pure white colour will appear grey.

Be careful to note just where each colour actually is. Then note any conspicuous mark (the most useful place to look for is the breast). Is the bird plain (unmarked), spotted, streaked or striped? Does the tail have a band at the tips, or white spots or white sides? Does the bird have a rump-patch? Do the wings have light wing-bars, or are they plain? The presence or absence of these bars is very important in small groups of birds like flycatchers and warblers. Does the bird have a "stripe" over the eye, or a

ring around the eye? Is the crown striped, or is there a patch on the crown?

The wings of water-birds are very important. Notice if they have "black tips" or light "patches", "stripes", or solid colouring. For, one such mark alone, with the size of the bird, is often enough to establish its identity. If you are good at sketching, so much the better. Then the bird can be best dealt with by a field sketch, showing the "principal parts" of it, as well as details of plumage, legs, bill and eyes.

The bird's voice is often the best, and sometimes the only, clue to its identity in the field. Some birds have sweet songs; some have harsh calls, some have warbling notes and so on. The cuckoos and nightjars are identified by their calls alone. You should try to describe all notes uttered by the unknown bird in words—what the bird seems to say as you hear it: like "chew-weet", "tee-tee"-"ka-ka", "cheer-you-cheer-you", "tree-tree", "phik-phik-phikar", "wet-my-lips", "bo-bo-link", and so on. And say if the call was "musical", "metallic", "harsh", "soft" or 'trilling".

Then, finally, study the food habits and the manner of eating; and note the nature of the place where the bird was seen, e.g., marshes, river-beds, gardens, groves, jungles, cultivated fields, etc.

Now, notice if the bird sits on trees, across a branch or along it. If it sits on an exposed perch, does it dart out after an insect and return? If on the tree, does it climb upwards in spirals, like a creeper, or in jerks, using the tail as a brace, like a woodpecker, or does it go down head first, like a nuthatch?

If the bird is on the ground, does it run, walk or hop, like a sparrow? Does it rummage about among dead leaves? Does it travel in flocks, go about singly, or in pairs? In the air, is the flight fast or slow; are the wing-beats rapid or not; does it wheel, sail, soar, or hover?

If in the water, does it swim well and can it dive, or does it dabble and tip up? Can it take off from the water easily or does it patter over the surface before getting into the air?

Does it dip up and down or have a straight arrowlike flight, like a dove; or does it fly erratically—lurching this way or that? Does it skim like a swallow? Or soar like a hawk? Does it beat its wings quickly like a duck? Or slowly like a heron? Does it go with an even wing-beat or with several flaps? Does it hover in one spot and then dive head first into the water, like a kingfisher? Or does it wade? Is it a long-legged bird which spends much of its time standing motionless like a heron or does it run along the muddy margin like a sand-piper? Does

it probe in the mud with its bill or pick at things?

Later on, when you are able to know your birds, you can take up the identification of nests and eggs. You will find studies on the incubation, hatching and fledging of birds very interesting. As your powers of observation develop, you will begin to learn a great many interesting things. For example, you will discover in what sort of habitats your local birds are distributed; the number of birds; how many birds are nesting in or around you; what food is eaten in different seasons and in different places. The daily habits, display, and courtship of birds are fascinating games of skill for the watcher!

GLOSSARY

barbet (*koturwa*)
bee-eater (*patringa*)
bulbul (*bulbul*)

chat (*pidda*)
chicken (*murghi*)
cormorant (*pan-kowwa*)
crane (*saras*)
crow (*kowwa*)
cuckoo (*papiha*)
curlew (*gulinda*)

stone curlew (*barsiri*)

dove (*panduk*)
drongo (*kotwal* or *bhuchenga*)
duck (*batakh*)

eagle (*baz*)

falcon (*laggar*)
fantail flycatcher (*chakdil*)
paradise flycatcher (*doodhraj*)

goose, wild (*hans*)
grebe (*pandubi*)

gull (*dhomra*)

hawk (*basha*)
heron (*anjan*)
large pied heron (*bara dhanesh*)
hornbill (*dhanesh*)

indian roller (*nilkanth*)

jacana (*kattori*)

kingfisher (*machhli-lowka*)
kite (*cheel*)
koel (*koyal*)

lapwing (*titihri*)
lark (*bhurut*)

magpie robin (*dhayal*)
minivet (*lalchashm*)
moorhen (*kalim*)

common myna (*desi myna*)
hill myna (*pahari myna*)
pied myna (*ablak myna*)

oriole (*pirola* or *pilak*)
osprey (*machhlimar*)
ostrich (*shutarmurg*)
owl (*ullu*)

parakeet (*tota*)
partridge (*teetar*)
peacock (*mor*)
phalarope (*tuhi*)
pheasant (*chaman kulu*)
pigeon (*kabutar*)
pipit (*sengur* or *bageri*)
plover (*zirrea*)

quail (*bater*)
bustard quail (*gulu*)
button quail (*lawa*)
mountain quail (*pahari lawa*)

rosy pastor (*gulabi myna*)

sand martin (*abali*)
sandpiper (*tutwari*)

shrike (*lahtora*)
snipe (*chaha*)
sparrow (*gauraiya*)
stork (*haji,lag-lag*)
sun-bird (*phulchuki*)
swallow (*ababeel*)
swift (*babila*)

tailor-bird (*durzee*)
tern (*tehari*)
tit (*ramgangra*)
tree-pie (*motri*)

vulture (*gidh*)

wagtail (*dhobin* or *khanjan*)
warbler (*phutki*)
sedge warbler
water-hen (*murgabi*)
weaver-bird (*baya*)
woodcock (*tutihar*)
woodpecker (*kathphorwa*)

A sample on
"HOW TO KEEP A NOTE-BOOK"

Number seen	–
Common Name	– Kite
Size	+ As domestic fowl
Colours	+ Mottled brown
Character	– Thievish, cowardly and lazy
Food	– Largely flesh
Nest	– Big untidy platform made of coarse sticks, sometimes dirty rags
Nesting season	– January-April
Eggs	– White-splashed red or brown
Enemies	– Crows and King Crows
Date first seen this year Approximate date last seen this year	– Seen all the year
Other notes	– Only big bird of prey whose tail is forked. Seizes food with claws, not with beak, very keen eyesight, swoops for small things from a great height.

Illustration

ORIOLE

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